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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/762,519	02/07/2001	Toshikazu Tomioka	10059-372US	4800

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AKIN GUMP STRAUSS HAUER & FELD L.L.P.
ONE COMMERCE SQUARE
2005 MARKET STREET, SUITE 2200
PHILADELPHIA, PA 19103-7013

EXAMINER	
MUTSCHLER, BRIAN L	

ART UNIT	PAPER NUMBER
1753	

DATE MAILED: 10/03/2003

4

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/762,519	TOMIOKA ET AL.	
	Examiner	Art Unit	
	Brian L. Mutschler	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) *1-7* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 February 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-7, drawn to an electrochemical device comprising a circuit generating a potential difference.

Group II, claim(s) 8-14, drawn to an electrochemical device comprising a circuit short-circuiting pieces of electrodes.

2. The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I uses electrodes requiring a potential applied by a circuit; Group II requires a circuit that short-circuits pieces of electrodes having different oxidation/reduction potentials. Since electrodes are commonly used in electrochemical devices, the inventive concept is the way in which the circuit is powered, either through the circuit, or by the oxidation/reduction potential differences of the electrodes.

3. During a telephone conversation with Mr. William Schwarze on September 10, 2003, a provisional election was made without traverse to prosecute the invention of Group II, claims 8-14. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-7 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Specification

5. The abstract of the disclosure is objected to because it is too long. Correction is required. See MPEP § 608.01(b).

6. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The

disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

7. The disclosure is objected to because of the following informalities:

a. The disclosure contains many grammatical errors and awkward language. For example, in the last line of page 1, "do not re-extracted" should be changed to --do not re-extract--; on page 2 at lines 5-6, "higher quantitative" should be changed to --higher quantities--; on page 2 at line 11, "at the time of wasting" should be changed to --at the time of disposal--; and on the second to last line on page 2, "arises" should be changed to --raises--. Due to the length of the disclosure, Applicant's assistance is kindly requested to correct these and any other errors present.

b. On page 15 at line 8, the meaning of "……" is unclear.

c. In Table I on page 37, the microorganism migration direction for the second electrode appears to be incorrect. When the second electrode is "-" and the third electrode is "+" the microorganism should migrate "↓", and when the second electrode is "NC" and the third electrode is "-" the microorganism should be not migrate "•". The second and third columns appear to be switched for the second electrode.

d. On page 58 at line 25, the meaning of "……" is unclear.

Appropriate correction is required.

Claim Objections

8. Claims 12 and 14 are objected to because of the following informalities:

a. In claim 12 at line 2, please change "one" to --an electrode--.

b. In claim 14 at line 2, please change "one" to --an electrode--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 8-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 recites the limitation "wherein said n pieces of electrodes" in line 2. There is insufficient antecedent basis for this limitation in the claim. It is suggested that the phrase be amended to --comprising at least 2 electrodes--. The use of the term "pieces" does not appear to be required because each piece of electrode functions as an electrode; in other words, the electrode does not require more than one piece to function as an electrode. The claim language is inconsistent and switches between "pieces of electrodes" and "electrodes". Please note, the use of parenthesis to define the number of pieces, such as the phrase "(n≥2)" used in claim 1, is indefinite because it is not clear whether or not the parenthetical is a positive limitation of the claim. The same applies to dependent claims 9-14.

Claim 8 recites the limitation "said circuit" in line 4. There is insufficient antecedent basis for this limitation in the claim. The same applies to dependent claims 9-14.

Claim 8 recites the limitation "the aligned direction of said electrodes" in line 6. This limitation is indefinite because it lacks antecedent basis and does not clearly define the structure of the device. When referring to an "aligned direction", the orientation of the electrodes should be defined as well. Are the electrodes parallel to one another in a side-by-side relationship, or are the electrodes co-linear with one another? In the first case, an aligned direction would mean that the particles would move perpendicular to the electrodes, whereas in the second case, an aligned direction would mean that the particles moved parallel to the electrodes. In other geometries, such a spiral or vortex electrodes, as disclosed in the specification, the movement can be "aligned" in other directions relative to the electrodes. The same applies to dependent claims 9-14.

Claim 10 recites the limitations "an electrode having a higher oxidation/reduction potential" in lines 3-4 and "an electrode having a lower oxidation/reduction potential" in line 7. The terms "higher" and "lower" are relative terms and should be defined with respect to another feature having an oxidation/reduction property, such as another electrode.

Claim 11 recites the limitation "the space between the electrodes" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim. It is suggested that the phrase be changed to --a space between the electrodes--.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 8-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Muroki (U.S. Pat. No. 5,944,685).

Regarding claim 8, Muroki teaches an electrochemical device for moving charged particles by electrophoresis comprising two electrodes (**2**, **4**) having different oxidation/reduction potentials and a circuit (conductive sheets) (**5**, **5'**) that short-circuit the electrodes (figs. 1A and 1B; abstract; col. 5, line 7 to col. 6, line 53). The particles would move in a direction aligned perpendicular to the surface of the electrodes (**2**, **4**).

Regarding claim 9, since the device of Muroki is designed for moving particles electrophoretically, it would be capable of moving particles covered with protein, which contain charged groups.

Regarding claim 10, both electrodes (**2**, **4**) in the device of Muroki are capable of permitting fluid to flow through. One electrode (**4**) has a grid structure and the other electrode (**2**) can be a meshed metal film or a metal film with perforated patterns (figs.

1A and 1B; col. 5, lines 7-35). Therefore, the device has introduction/discharge portions at either side.

Regarding claim 11, the device has a non-conductive pad layer (**42**) disposed between the electrodes (**2**, **4**) (fig. 1B; col. 5, lines 7-41). The non-conductive pad (**42**) has a grid structure that would allow liquid to pass through (fig. 1B).

Regarding claims 12-14, the device of Muroki has two electrodes (**2**, **4**) that have structures that would allow liquid to pass through (figs. 1A and 1B; col. 5, lines 7-35). One electrode (**4**) has a grid structure and electrode (**2**) can be a meshed metal film or a metal film with perforated patterns (figs. 1A and 1B; col. 5, lines 7-35). The electrodes (**2**, **4**) are in a stacked structure with the non-conductive pad (**42**) disposed between the electrodes (fig. 1B).

Since Muroki teaches all of the structural limitations recited in the claims, the reference is deemed to be anticipatory.

13. Claims 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Anderson (U.S. Pat. No. 3,865,711).

Regarding claim 8, Anderson teaches a device for electrochemically separating components in a mixture using either galvanic or impressed direct current (col. 5, lines 27-29). Impressed direct current uses an external power source to provide a current, whereas galvanic current generates its own current based on the oxidation/reduction potentials of the electrodes. The device uses a steel tank (**10**) that acts as the cathode

and anodes (**17**, **21**, **23**) dispersed throughout the tank (fig. 1). When galvanic current is used, the electrodes would be short-circuited.

Regarding claims 8 and 9, the device is capable of electrophoretically separating charged particles such as protein-covered particles.

Regarding claim 10, the device has introduction/discharge portions in the vicinity of the electrodes (fig. 1).

Since Anderson teaches all of the limitations recited in the instant claims, the reference is deemed to be anticipatory.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references disclose electrophoretically transporting particles.

U.S. Pat. No. 4,767,401 Seiderman

U.S. Pat. No. 4,927,408 Haak et al.

U.S. Pat. No. 6,129,696 Sibalis

U.S. Pat. No. 6,334,856 Allen et al.

U.S. Pat. No. 6,522,918 Crisp et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian L. Mutschler whose telephone number is (703) 305-0180. The examiner can normally be reached on Monday-Friday from 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (703) 308-3322. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

blm
September 25, 2003

NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700